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## (54) NON-AQUEOUS SECONDARY BATTERY

(57)Abstract:

PROBLEM TO BE SOLVED: To improve energy quantity of a lithium secondary battery, and improve the cycle lifetime thereof by forming the battery out of a positive electrode having positive electrode active material as a transition metal oxide capable of absorbing and releasing lithium, a negative electrode having negative electrode material using the compound including a silicon atom, and the non- aqueous electrolyte.

SOLUTION: A positive electrode having positive electrode active material  $\text{LiCoO}_2$  as a transition metal oxide capable of absorbing and releasing lithium and a mixture material of acetylene black and polyvinylidene fluoride is manufactured. A negative electrode having negative electrode material of the alloy including a silicon atom and having 0.01-50  $\mu\text{m}$  of mean grain size and including at least one kind or more of alkali earth group metal, transition metal and semimetal is manufactured. Furthermore, the colorless electrolyte having a specific gravity at 1.135 and formed by dissolving ethylene carbonate in the di-edthyl carbonate little

by little and dissolving LiBF<sub>4</sub> and LiPF<sub>6</sub> in order is filled between the positive electrode and the negative electrode. With this structure, the discharging capacity, energy quantity and cycle lifetime are improved.

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